Time and Space

Or, why we need a clock to measure the stars.

What is Time?

Officially in mathematical science, it is just a dimension. Seems simple but… our meaning of time in language isn't.

Definition:

1. the indefinite continued progress of existence and events in the past, present, and future regarded as a whole.

What?????

The science definition seemed better… it's not.

1rst modern standard GMT (Greenwich Mean Time), 1200hrs at Greenwich UK

In 1925 switched to GCT (Greenwich Civil Time) starting at midnight.

Then TAI (International Atomic Time) began at 0 on Jan. 1, 1958

From 1960 to 1983, the standard was ET (Ephemeris Time)

From 1972 another standard was UT (Universal Time)

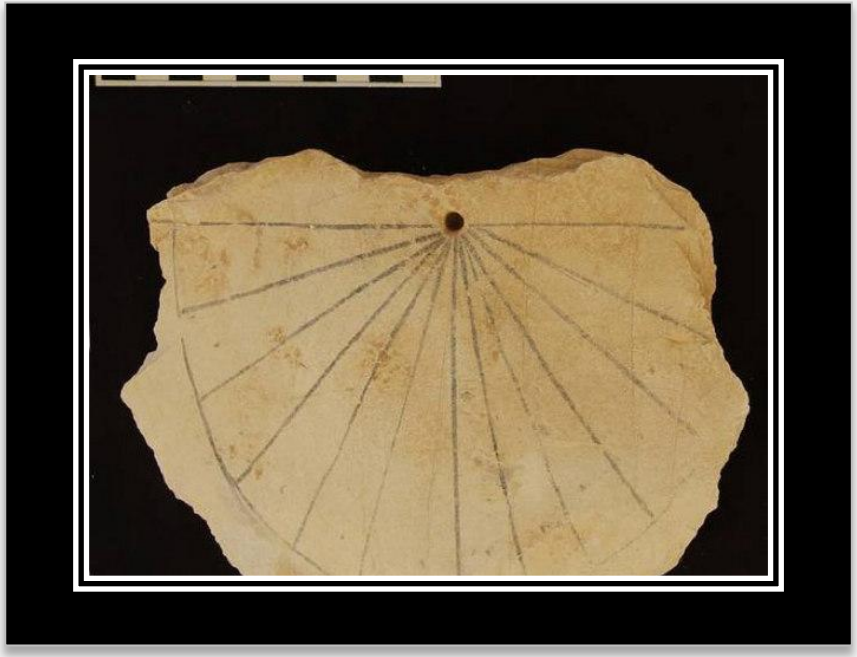
GPS time was introduced in 1980, and is now locked to TAI

TDT (Terrestrial Dynamical Time) overtook ET in 1984 to 2001

We now use TT (Terrestrial Time), which replaced TDT in 2001

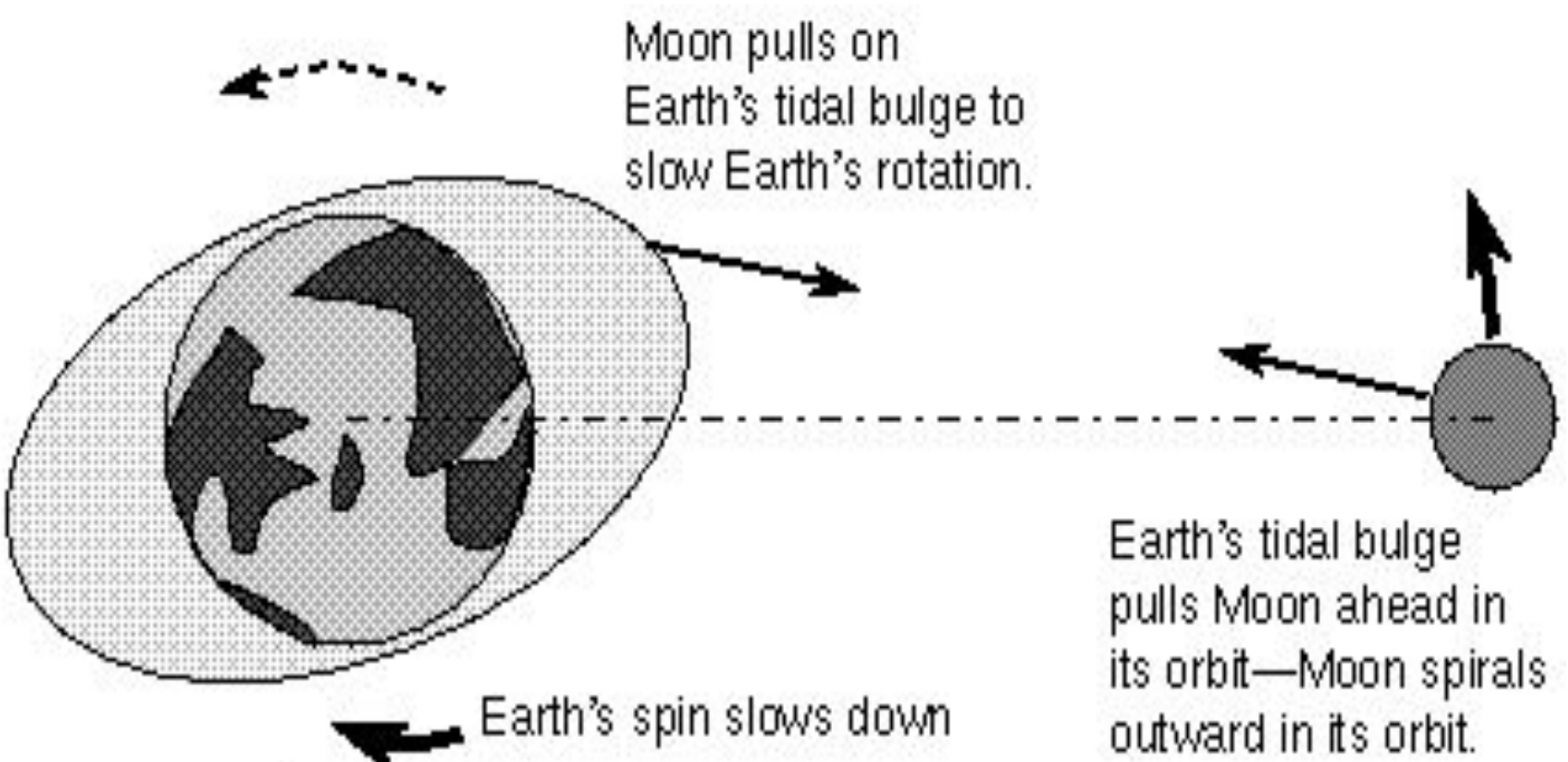
Are Scientists Crazy?

Maybe, but measuring time had to start somewhere. The first clock was the Sun, the second was the Moon. Astronomy and time in human history are bound together.

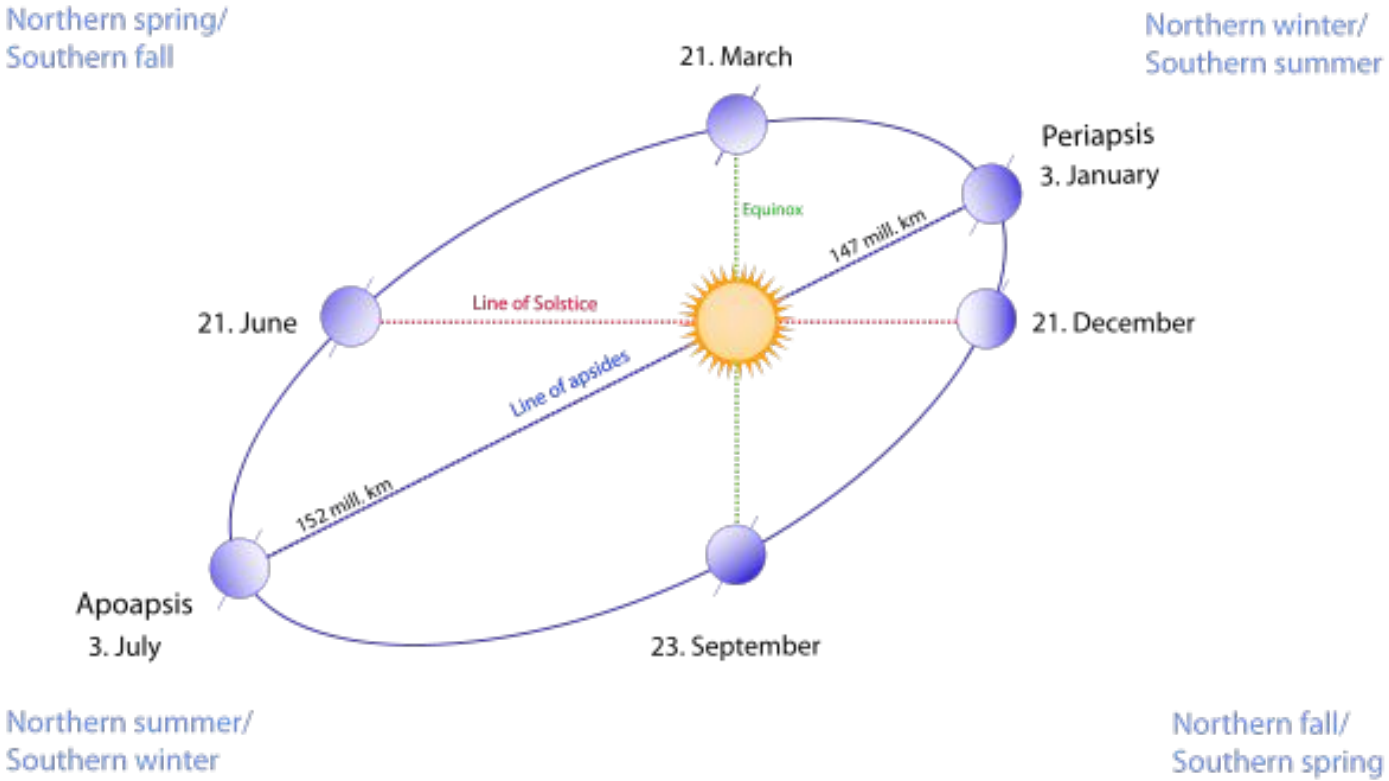


Egyptian sundial (1500 B.C.) with 12 “hours.”

Why So Complicated? Pt. 1



Why So Complicated? Pt. 2 365.25 days...



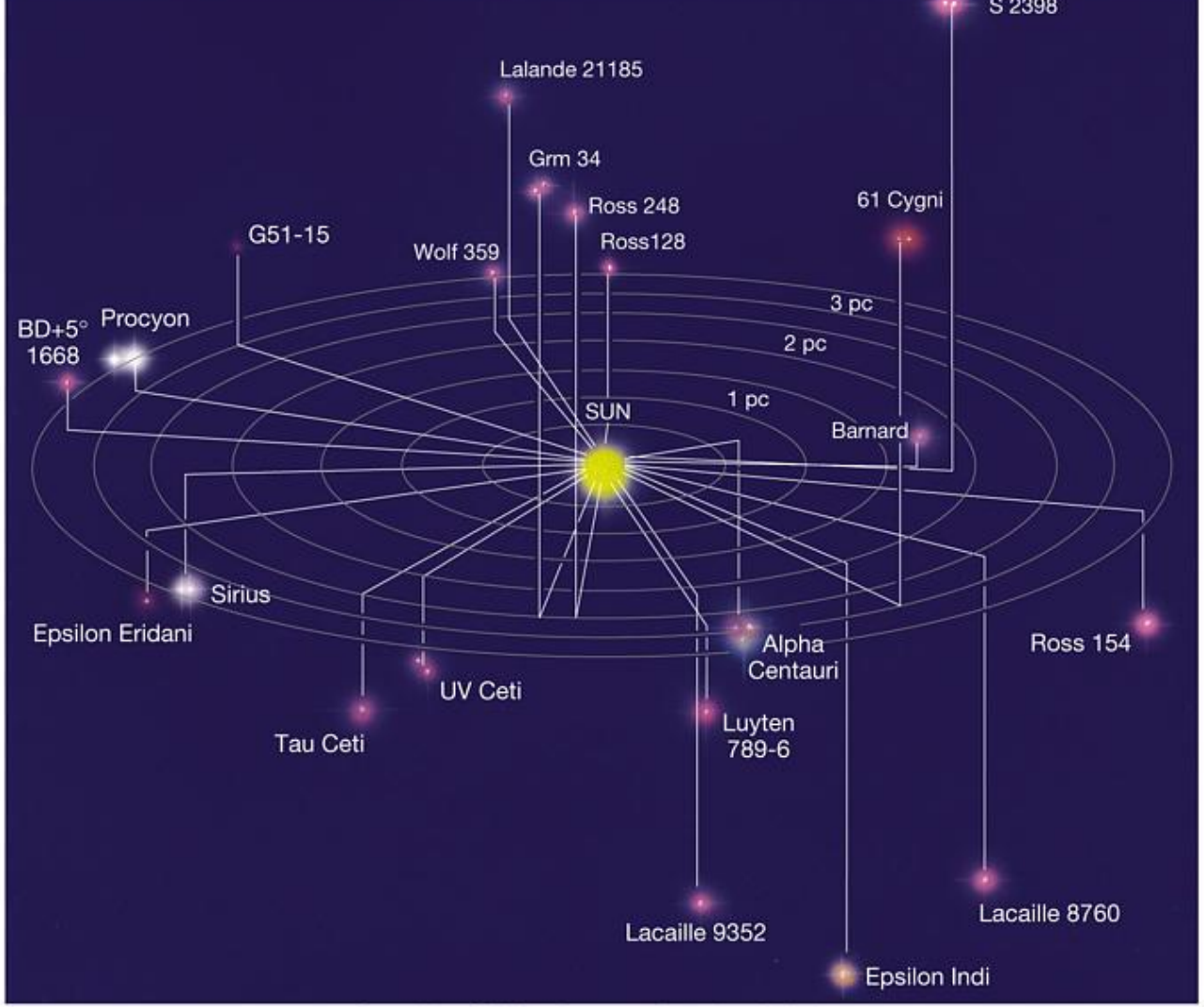
What is Space?

Space has many broad definitions, but for our purposes the dictionary does well

Definition:

1. the dimensions of height, depth, and width within which all things exist and move.

There are some issues though....



And now a really odd thing… we use time to measure distance in Space.

Why a light year?

The speed of light in a vacuum is fixed, nothing (YET) can go faster. It is the natural index to measure time or distance.

One light year = 9.4 trillion kilometers, 5.8 trillion miles, or 0.306601 parsecs

Activity - Check out your Solar System, and start using Google Sky

Use this cool tool to explore the astronomic bodies nearby - http://www.solarsystemscope.com/

Download Google Sky… then go check out a what you see at night!